

Impact Assessment

Guidelines Workshop

September 27-28, 2006

Bakersfield, California

Dick Anderson

California Energy Commission

Impact Assessment

Simple Assessment- species, number, professional judgement/knowledge.

More complicated- add policy goals, societal values, sensitive species status and susceptibility and laws.

Complicated- add impact/risk assessment and credible estimate of deaths

Risk

Risk- possibility of loss or injury, something that creates or suggests a hazard, or probability of loss or death.

At Risk- state or condition marked by a high level of risk or susceptibility.

Some Variables That May Affect Risk

- **Bird Species**
- **Bird Behavior/Use of Area**
- **Habitat Type and Quality**
- **Topography**
- **Technology**

One Measure of Impact

- Some portion (0-100%) of birds and bats will collide.
- Compare this number with laws/sensitive species/local or regional population numbers.
- Consider the potential for risk changes due to weather or seasons, etc.
- Determine level of impact.

Relative Risk

- Cannot do a complete count of bird use nor a complete count of fatalities
- Compares bird use or bird passage rate to bird fatalities
- If use goes up we may expect fatalities to go up (may depend on species)
- Expect the same is true for bats

Simple Ecological Risk Model

- Action-Birds may collide with *installed wind turbines*
- Qualitative and quantitative determination of the probability of impact/death
- Statement of consequence (impact finding)

Determining Probability

- Requires bird use and bird fatality data
- Feedback loop/meta-analysis
- Standard Pre-permitting and operations monitoring Protocol will establish a Risk Assessment Framework

Models

- Modeling is an art not a science
- All models are wrong, some are useful and we should seek those out (Dr. George Box)
- Eventually using standardized protocols, a model will be produced (via meta-analysis) that becomes increasingly more sophisticated and provides increasing confidence.

Metrics used to Determine Impacts/Risk

- Bird Use/Time
- Bird Use in the Rotor Swept Area or Passage Rate through Rotor Swept Area/time
- Bird Fatalities
- Estimate of (Pre) or Actual (Post) deaths
 - Birds/MW(installed capacity)/Year
 - Raptors/MW/Year
- Impact/Risk Estimates- Developed via feedback from other standard protocol results

Caution

Be cautious regarding using a range or threshold for bird deaths such as Virginia has used of a national average of 3.5 birds/turbine/year or 1.8 bats/turbine/year.

Altamont-

All birds= 0.2253 birds/turbine/year and
2.0557 birds/MW/year

Raptors= 0.0924 raptors /turbine/year and
1.0387 raptors/MW/year

Indirect Impacts

- Assume occurring at some level
- Use BACI sample design to determine displacement or nesting or abundance reduction estimates

Cumulative Impacts

- Assume occurring at some level
- Population level study may be needed (costly and long-term)

